

Project *brief*

Thünen Institut of Organic Farming

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MIX-ENABLE – Mixing young cattle and broilers

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- **Mixed grazing by cattle and broilers resulted in fewer losses of broilers due to predatory birds**
- **When having access to the same pasture as cattle, broilers were observed in greater numbers in the outdoor area**
- **Broilers did not scratch in cow pats looking for food and had no effect on the number of parasite eggs in cattle feces**



Background and aims

It is assumed that mixed farms are more resilient to environmental and market changes. The CORE Organic Cofund project "MIX-ENABLE" has investigated this assumption and has examined farms focusing on those with mixed animal husbandry. Surveys on practical farms were conducted to get a better understanding of the status quo and different strategies already implemented by farmers. Those surveys were also complemented by experiments designed to investigate effects of keeping different animal species together in more detail. For example, combining poultry and other animal species on pasture could provide several benefits: The partner species to poultry could act as a deterrent to predators that otherwise cause high losses when poultry are kept outdoors. At the same time, herbivores could possibly benefit from the poultry as they might reduce the parasite load on pasture by scratching up the cattle dung which provides an important habitat for an intermediate but obligatory stage of the parasites. Both questions were addressed in the experiments at the Thünen Institute.

Furthermore, we investigated whether poultry adapts and changes its use of the open area when cattle grazed also on the pasture at the same time.

Proceeding

In seven experimental rounds from 2018 to 2021, broilers and young cattle were either kept separately or together on one pasture. Each group consisted of 54–60 broilers and 10 young cattle, with the young cattle being used in both experimental rounds of the same year. The pasture management consisted of a rotational grazing system in which the animals were moved to



Source: Severin Hübner

the next paddock weekly. Each experimental round finished after six weeks when the broilers were slaughtered.

Losses in broilers were documented daily and video recordings were used to verify the cause. On two days per week, the behavior of the animals was directly observed. The use of the outdoor area and type of behavior of the animals on pasture were documented via scan sampling. Furthermore, as animal welfare indicators in broilers, plumage cleanliness was documented the day before slaughter and leg health (footpad dermatitis and hock burns) as well as breast blisters were recorded on the carcass.

The status of cow pats on pasture was documented weekly. Particular attention was paid to scratch marks. These could indicate that broilers were looking for feed in the cow dung. In addition, artificial cow pats were laid out in 2020 and 2021 and beetle and larval populations in the cow pats were counted at regular intervals.

Parasite loads in the young cattle were estimated by biweekly examination of fecal samples.

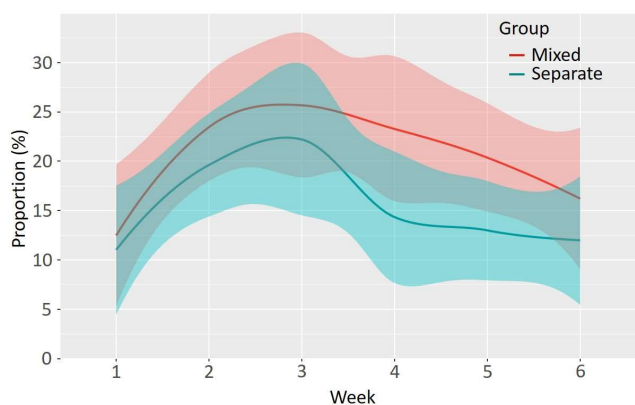
Results

Mixing broilers with cattle showed clear effects on raptor-induced losses of broilers. Lower losses of broilers were recorded in each of the experimental rounds in the groups where broilers and cattle grazed together. The median value for

losses in this group was one animal per experimental round while in the separately grazed group a median of four animals per run were killed by a raptor. The risk of falling victim to a raptor was thus 3.2 times higher when there were no cattle on the same pasture. An effect on other predators could not be determined, since only two fox attacks occurred - one in each of the two groups.

In the mixed grazing system, broilers showed greater range use compared to the groups without cattle. On average, 24% of broilers were seen outside in the mixed system during the observation periods. However, on average, only 19% of broilers kept alone on pasture did so. The differences were particularly pronounced in trial weeks 2 to 5 but were within the margin of error.

Means and 95%-confidence intervals of proportions of broilers outside depending on trial group (2019 – 2021)



Source: Severin Hübner

In addition, broilers were seen at a greater distance from the hut when cattle were present on the same pasture. Thus, in the mixed group, individual broilers ventured up to a distance of nearly 90 m, while in the group without cattle, the farthest broiler was seen at only 55 m distance.

The assessment of the selected animal welfare indicators did not produce a consistent picture of the broilers' wellbeing in the

treatment groups. Footpad dermatitis occurred on average in 10% of the broilers, somewhat more frequently in early summer. More severe forms of footpad ulcerations were rarely found. About 3% of broilers showed signs of hock burns, but only superficial. An average of 5% of broilers had breast blisters.

The presence of broilers on the pastures of the young cattle had no effect on the number of parasite eggs found in the cattle feces. Broilers were also not observed scratching the cow pats during any of the direct observation periods. Direct scratching or pecking marks on the dung pats were never found, although artificially laid out dung pats showed that beetles of the genera *Aphodius* and *Spharidium* were present in large numbers in and on the cattle manure, especially in the days following its distribution on pasture. In the weeks following the spreading of the cow pats, fly larvae were also found in the cow dung, although in varying numbers. Thus, it can be assumed that cattle manure is a food source for poultry.

Conclusion

In this trial, mixed grazing of young cattle and broilers resulted in several benefits for the broilers: fewer animals were killed by birds of prey and they were more numerous and farther distributed in the outdoor area. On the other side, there were no advantages or disadvantages for the young cattle.

Recommendations

Farmers interested in keeping broiler and cattle on the same pasture should consider the following:

- In this trial, samples from pasture did not provide any evidence of salmonella. In general, though, the supervising veterinarian or veterinary office should be consulted whether there are reasons against the joint keeping of poultry and cattle on pasture.
- When calculating the size of the area, the feed requirements of the cattle must be considered in addition to the legal requirement for the outdoor areas of poultry.
- Pasture management should aim at protection against pasture parasites for both species.

Further information

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Martin G, et al (2020)
 Potential of multi-species livestock farming to improve the sustainability of livestock farms: A review.
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